Vague warning language impacts perceptions of vaping risks, study finds

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When it comes to e-cigarette warning labels, respondents in focus groups organized by Cornell University researchers were clear: Give it to me straight.

But approximately 20 years after they hit the market, electronic cigarettes' precise health risks remain unclear. And for adults trying to quit smoking conventional cigarettes, ambiguity in messaging can skew perceptions of the health benefits of using these products as an alternative to combustible cigarettes.

A multidisciplinary team led by Jeff Niederdeppe, professor of communication in the College of Agriculture and Life Sciences (CALS) and senior associate dean in the Jeb E. Brooks School of Public Policy, and Sahara Byrne, professor of communication and senior associate dean (CALS), tested 17 different e-cigarette warning statements on 16 focus groups featuring a total of 69 adults and youth with varying smoking profiles.

They found that the use of uncertain and vague language regarding the risks of the products was confusing and reduced risk perceptions, though specific risks to health communicated in the warning were generally accepted as valid outcomes of product use.

The team's new paper, "Perceived Threat and Fear Responses to e-Cigarette Warning Label Messages," published June 23 in *PLOS ONE*. Co-authors include Rosemary Avery, professor in the Brooks School of Public Policy; Amelia Greiner Safi, professor of social and behavioral sciences and public health practice in the Department of Public and Ecosystem Health, in the College of Veterinary Medicine; Michael Dorf, the Robert S. Stevens Professor of Law at Cornell Law School; Alan Mathios, professor in the Brooks School of Public Policy; and Motasem Kalaji, assistant professor of communication studies at California State University, Northridge.

The current paper follows two others from this research. The first, published in December in Preventive Medicine Reports and led by Avery and Mathios, addressed the challenges of communicating the benefits of switching from combustible cigarettes to e-cigarettes. The second, published in January in Health Communication and led by Greiner Safi, focused on the how uncertain and vague language in e-cigarette warnings may limit the public health benefit of those warnings.

The three papers could help inform future federal policy regarding e-cigarette warning labels.

Currently, e-cigarette labels carry the following message: "WARNING: This product contains nicotine. Nicotine is an addictive chemical." It's straightforward, for sure, but Niederdeppe said the Food and Drug Administration is exploring more powerful messages in an attempt to dissuade young people from taking up vaping.

"The FDA is trying to bridge this really difficult challenge of preventing young people from using a product, but not dissuading smokers from switching to something less harmful," Niederdeppe said. "And so, there's a lot of interest in trying to understand how to communicate in a way that tries to thread that needle."

Although e-cigarette use by young people dropped off considerably during the height of the pandemic, a 2022 study found that 14.3% of high school students and 3.3% of middle school students used vaping products regularly.

"We've got 50 to 60 years' worth of research on the effects on the body of smoking tobacco, but vaping products are relatively new," Avery said. "So though we think they are harm-reducing compared to cigarettes, there's still a lot we don't know about them. So how do you develop statements that are true and can stand up in court, when the science has not yet provided conclusive evidence of harm reduction?"

For their study, conducted in July-August 2020, the researchers recruited

37 adults (ages 18-67) and 32 youth (ages 14-16). The adult sample consisted of: two groups of adults who used both combustible cigarettes and e-cigarettes; two groups of adults who formerly smoked combustible cigarettes and switched to e-cigarettes only; and four groups of adults who currently smoked combustible cigarettes but not e-cigarettes.

The youth sample consisted of two separate groups of females and males who had used or tried e-cigarettes but not combustibles; and two separate groups of males and females who had never tried either.

The 17 experimental warning statements were categorized into five types: toxic ingredients (six messages); health effects (two); cognitive development (two); addiction (four); and unknown risks (three).

Each focus group saw eight randomly assigned warning statements, with at least one warning from all five categories. All responses were assigned one of four codes: danger control (stimuli that changes attitudes and behavior to avoid the danger); fear control (a threat in the message that generates attitudes and behaviors to control the danger); response efficacy (participant affirmed validity of the claim); response inefficacy (message was misinterpreted or otherwise misconstrued).

For adults, warnings highlighting cognitive and uncertain effects of e-cigarettes were most promising, although ambiguity—particularly related to e-cigarettes being an option for those trying to quit traditional cigarettes—was problematic.

"The harms of uncertain language may outweigh the benefits, and people can use that uncertain language to confirm their existing beliefs," Greiner Safi said. "The uncertainty causes more confusion, and so if the goal is to try to help people make decisions, or be better informed, that's not necessarily helping people be informed."

For young people—particularly young males—the warnings didn't always hit the mark.

"I was most surprised about the reaction of young males to the warning labels," Avery said, "and how much it's perhaps just a function of their age or their developmental stage, where they're much more likely to discount, misconstrue and/or dismiss the warnings."

The researchers hope their work—as well as more research on e-cigarettes' health risks—will lead to improved warnings that allow people to make sound, healthy choices.

"It is kind of the Wild West, in a sense," Niederdeppe said, "in terms of figuring out how comfortable people are with various scientific claims, given the relative novelty of the product."

More information: Rosemary J. Avery et al, Perceived threat and fear responses to e-cigarette warning label messages: Results from 16 focus groups with U.S. youth and adults, *PLOS ONE* (2023). DOI: 10.1371/journal.pone.0286806

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